



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/045,309	01/10/2002	David A. Boas	A34927 - 069225.0110	1298
30873	7590	01/25/2005		
DORSEY & WHITNEY LLP INTELLECTUAL PROPERTY DEPARTMENT 250 PARK AVENUE NEW YORK, NY 10177			EXAMINER ROSENBERGER, RICHARD A	
			ART UNIT 2877	PAPER NUMBER

DATE MAILED: 01/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/045,309

Applicant(s)

BOAS ET AL.

Examiner

Richard A Rosenberger

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11/2/2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-142 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 33-48,65-74 and 108-127 is/are allowed.
- 6) ☒ Claim(s) 1-13,16-18,23-32,49-59,75-88,91-93,103-107 and 128-137 is/are rejected.
- 7) ☒ Claim(s) 14,15,19,20,61-64,89,90,94-102 and 138-142 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                                                                |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                                                               | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                                           | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/2/2004</u> . | 6) <input type="checkbox"/> Other: _____                                                |

1. Claims 1-13, 16-18, 23-32, 49-59, 75-88, 91-93, 103-107, and 128-137 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng et al (US 6,516,209).

Cheng et al shows a method and system for determining the distributions of one of more properties in an absorbing and highly scattering medium (see the abstract, lines 1-4). Optical radiation is directed into the medium and radiation exiting the medium is received and detected. The system is "self-calibrating", that is, one or more calibration factors (the baseline discussed in the abstract, lines 16-19) is derived, and, as it is not known prior to the measurement and the calculations that derive it from the measured values, is a variable. One or more optical properties of the medium are derived using the received and detected radiation and the calibration factors, and the distribution in the medium is determined therefrom. Obtaining a distribution from the measuring data is solving an inverse problem.

The baseline inherently will include the relevant factors including the source and detector coupling and location factors. Those in the art can, using only ordinary skill in the art, choose particular wavelengths and geometries appropriate for the measurement being performed; the reference mentions the use of near infra-red (column 9, lines 26-29). Displaying the images obtained is at least obvious.

The reference discusses calculations; writing and storing a program on a computer readable medium to have a computer perform the calculations would have been obvious.

2. The remarks filed 2 November 2004 have been considered.

The remarks argue that the baseline of the Cheng et al reference is not a variable. This is not, however, correct. The remarks argue that a variable is something that “varies or is prone to variation” (remarks, page 24, lines 5-6). Clearly, the calculated baseline of Cheng et al fits this definition. It is calculated precisely because it is in fact “varies or is prone to variation”; if it were not a variable by this definition, there would be no point in the type of measurement and calculation disclosed by the Cheng et al reference. The Cheng reference notes that “[I]n some cases, output signals obtained from multiple different target areas may yield similar but not identical baselines” (column 15, lines 58-60); about as explicitly a teaching that the baseline is a “variable” (that is, “varies or is prone to variation”) as one could imagine.

The remarks argue that the Cheng et al reference uses “exact values” (remarks, page 24, line 15). However, the rejected claims do not require approximate or inaccurate values, just that the calibration factor is “a variable” (that is, it “varies or is prone to variation”), the an exact value can vary from one exact value to another in time or over space; a “variable” is not an inexact value, but

merely on that can vary. Notice also that Cheng (column 15, line 60 through column 16, line 1) discusses “average” or “composite” baselines, which are not “exact” values, as they do not necessarily reflect the actual, exact baseline at any particular point, but only approximates the value at all points.

It appears that, in particular with regard to this “exact value” argument that the remarks read into the claims details of the disclosure that at are not in the claims; a variable can be instantiated to an “exact value” and still remain a variable. It may be that the particular (unclaimed) method of the disclosure does use the calibration factors as inexact values, but this is not inherent in, and does not follow from, the mere statement that the calibration factors are recognized as being variable values, values that can vary or are prone to vary.

The remarks argue that the Cheng et al reference does not measure “optical properties of the medium”. This is not correct. Cheng et al measures optical characteristics. It uses optical illumination and detects optical light from the object resulting from the light interacting with the object or constituents thereof (see Cheng, column 7, lines 6-8, : “any substance ... which can interact with electromagnetic waves transmitting therethrough”). As the measurement of the reference is made of light after it has interacted with the object, the only possible measurements are of optical properties of the object. If the properties being measured were not optical properties, they would not interact with the light, and they would not, and could not, be measured by the system of the reference, which

uses optical radiation, and the interaction of the object being measured with the optical radiation, to make the measurements.

3. As set forth in the previous office action, claims 14, 15, 19-22, 40, 41, 46, 47, 60-64, 72-74, 89, 90, 94-102 and 125-127 contain allowable subject matter.

Similarly to reasons given in the previous office action relative to claims 14, 15, 40, 41, 89 and 90, new claims 138-142 contain allowable subject matter, as they include determining both the amplitude and phase of radiation exiting the medium or both the intensity and temporal delay of the radiation exiting the medium.

Upon consideration of the remarks, independent claims 33, 65 and 108, which includes "calculating the distribution of the at least one property based on the at least one measured parameter by calibration factors as freely varying quantities that are reconstructed in a model for a radiative transport within the medium" (claim 65, and similar language in claims 33 and 108) are allowable, as are claims 34-48, 66-74 and 109-127 as dependent therefrom.

Claims 14, 15, 19-22, 60-64, 89, 90, 94-102, and 138-142 are objected to as being dependent from unallowed parent claims and would be allowable if rewritten in independent form including all of the limitations of their respective parent claims.

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 2877

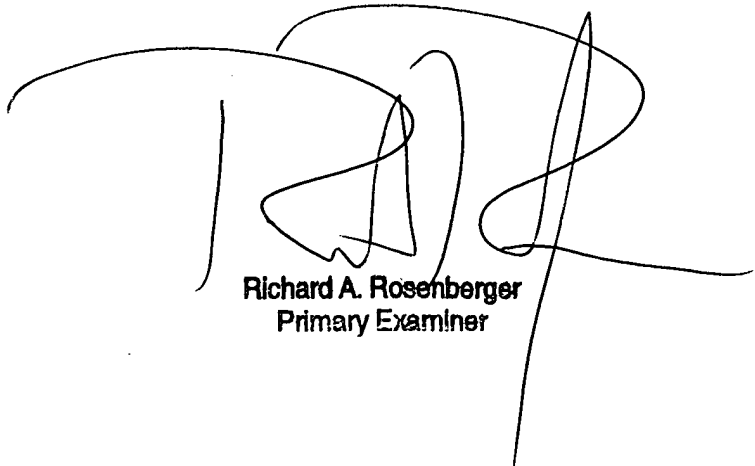
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard A Rosenberger whose telephone number is (571) 272-2428. The examiner can normally be reached on Monday through Friday during the hours of 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on (571) 272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

R. A. Rosenberger  
19 January 2005



Richard A. Rosenberger  
Primary Examiner